

sPHENIX EMCal /BNL Update

Weekly Mtg. 10/4/2016

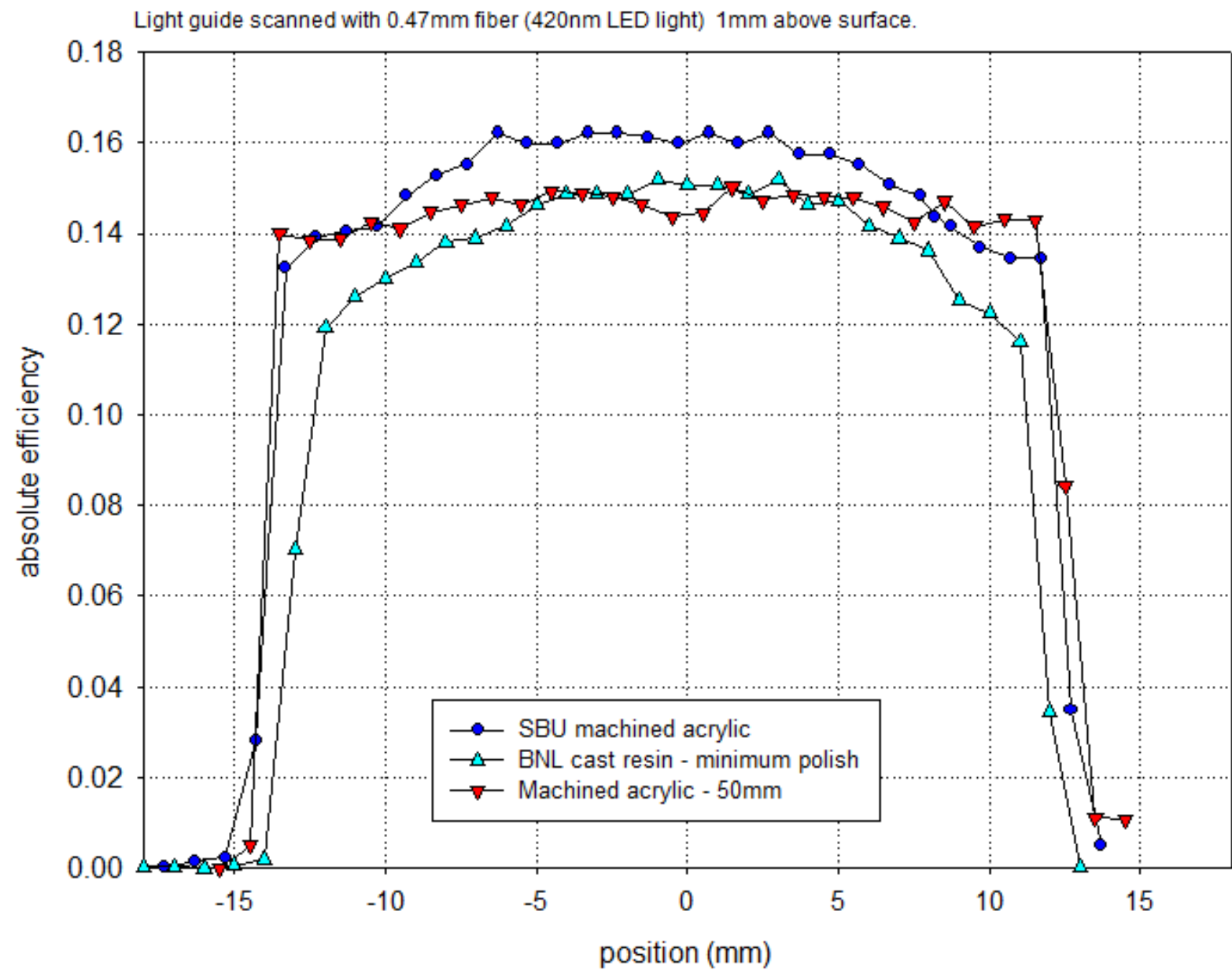
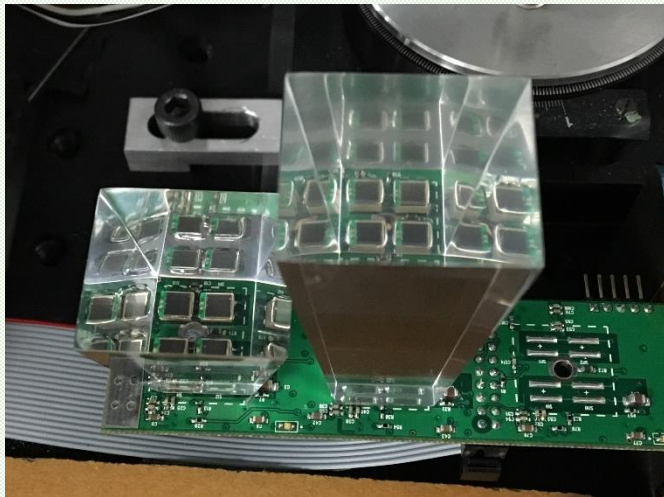
Light Guides and Light Collection

- injection molded parts delivered to BNL – arrive at Physics this afternoon?
- measured uniformity of longer version of prototype LG
- Drawings sent to SBU for machining of individual pieces

Prototype 1

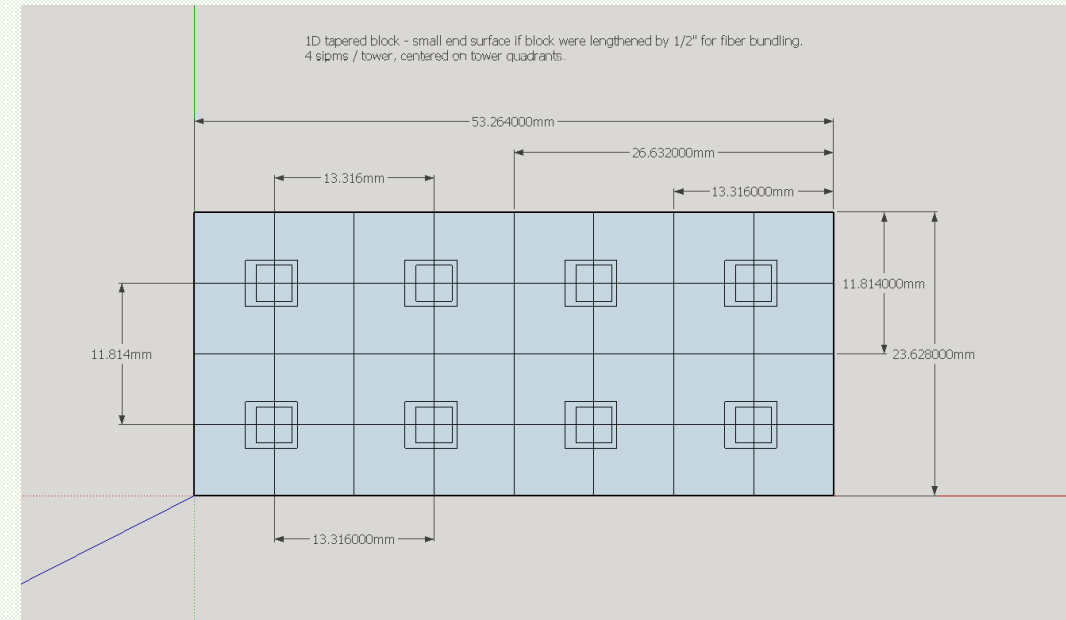
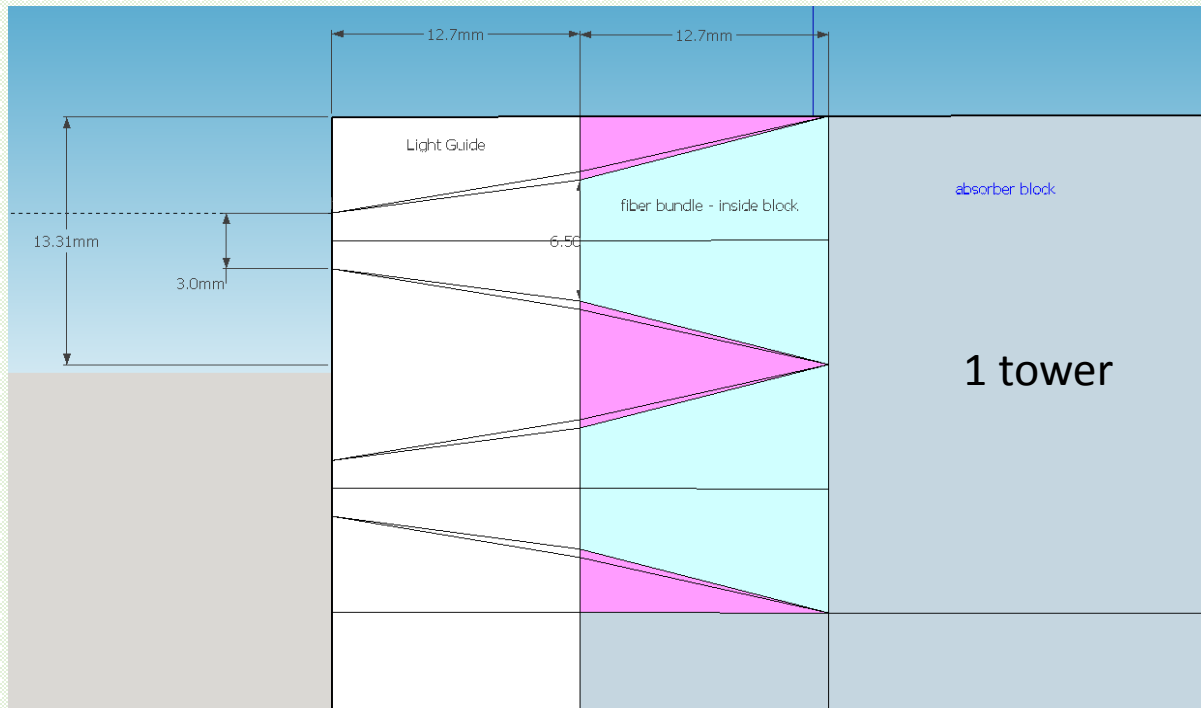
- Measured response of towers 24-31
- Ideas for correcting non-uniformity
- Any other improvements? – Position markings for testbeam?

Test 2x taller version of prototype
Light guide

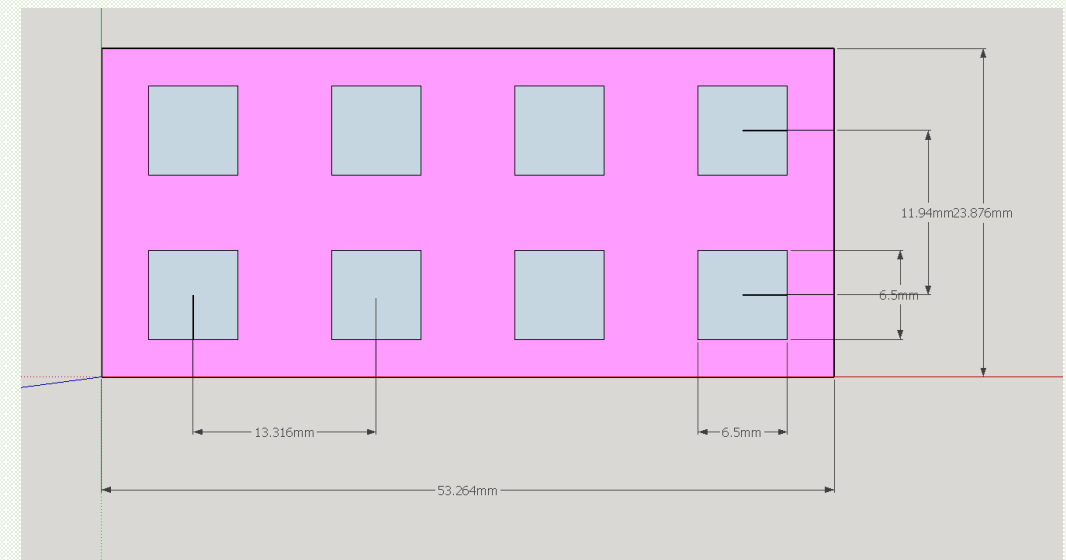


Alternative block design?

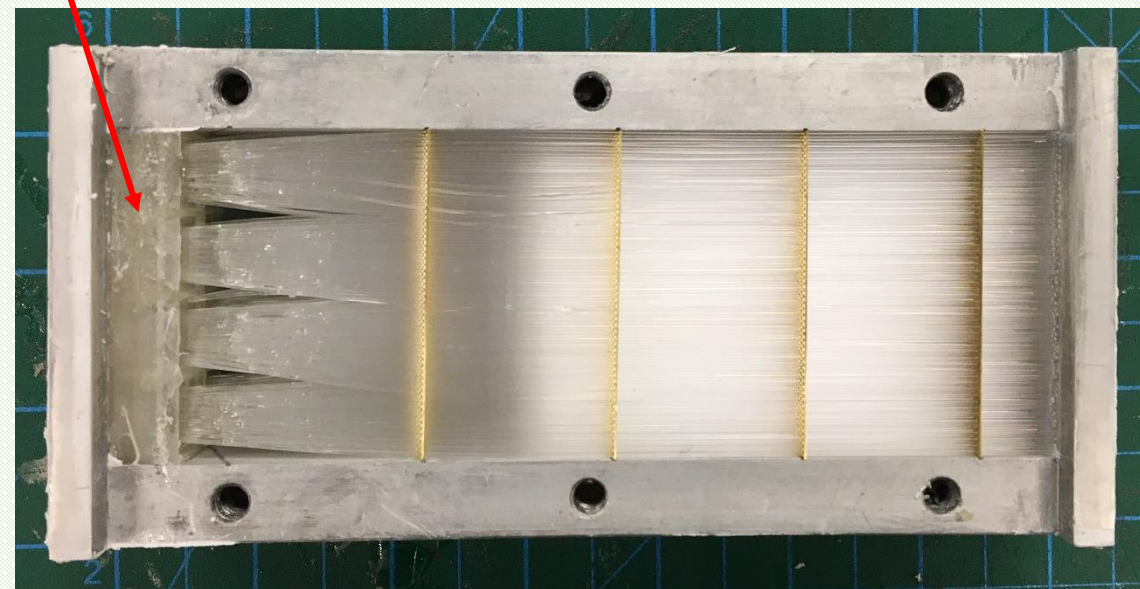
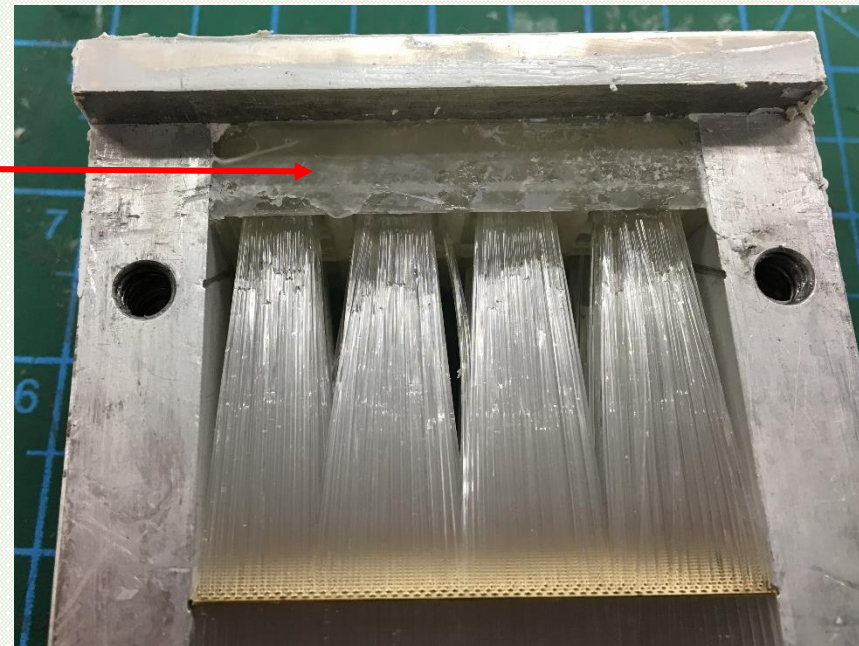
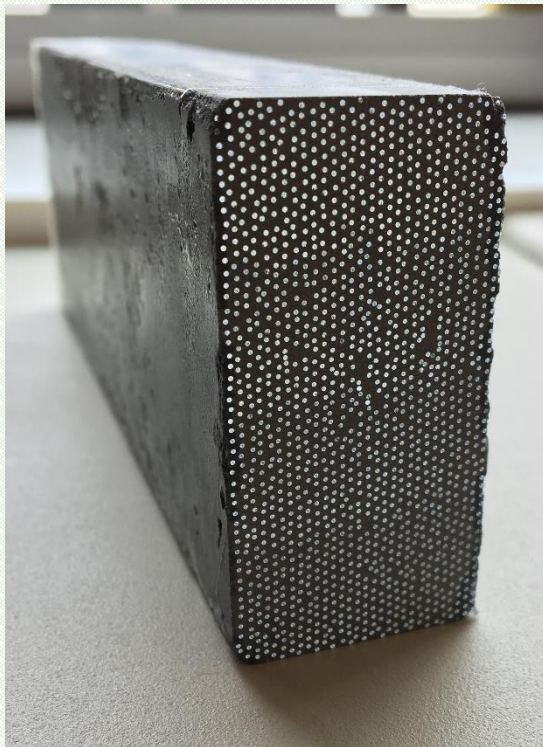
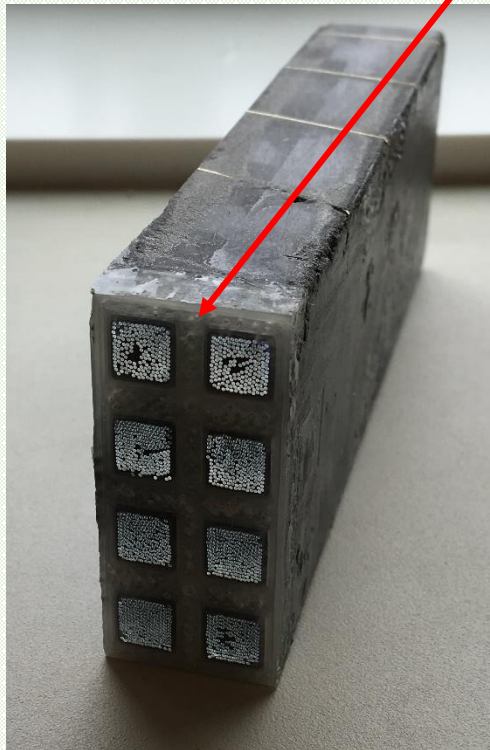
- Can we bundle the fibers in the block, so that a light guide is not needed?
- Fiber area is $> 4 \times 9\text{mm}^2$ active area of sipms, so some light guide is necessary.
- Using a cavity could eliminate coupling issues, make installation/replacement of sipm pcbs easier.
- Does the fiber bundling create other non-uniformities in the block response?



Plastic insert - to go into the mold and be cast into the block, bundles fibers



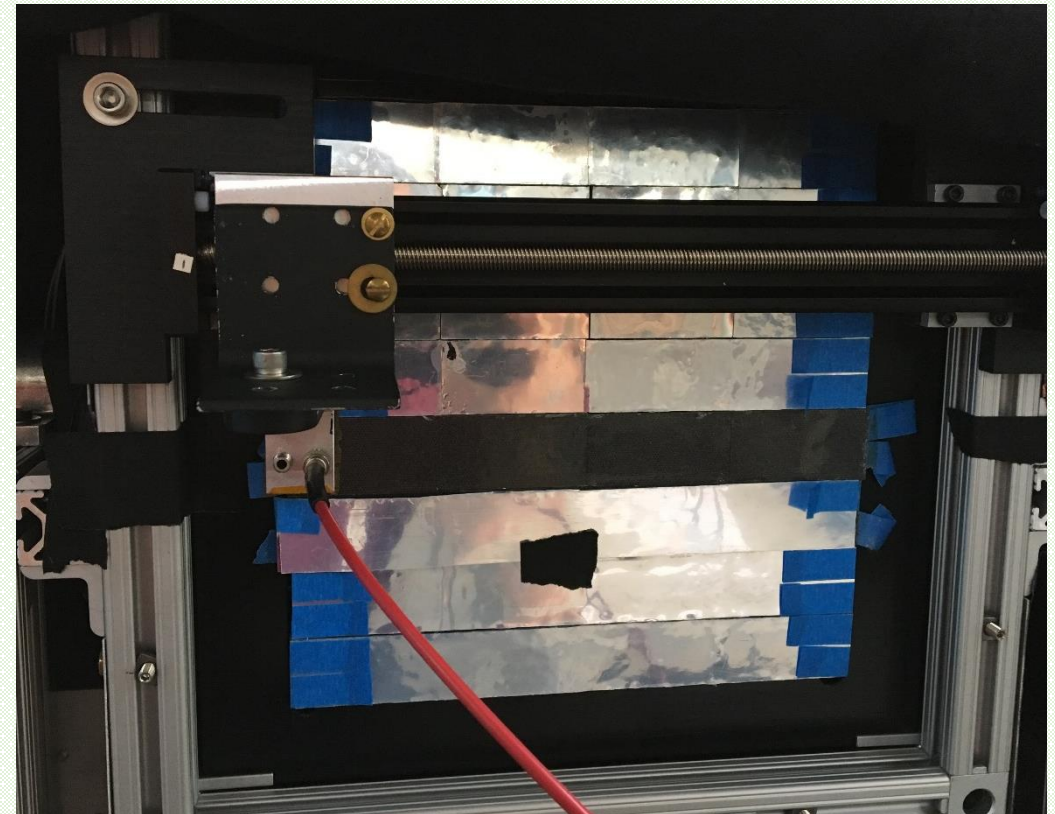
Printed insert –
Placed in mold and cast into the block



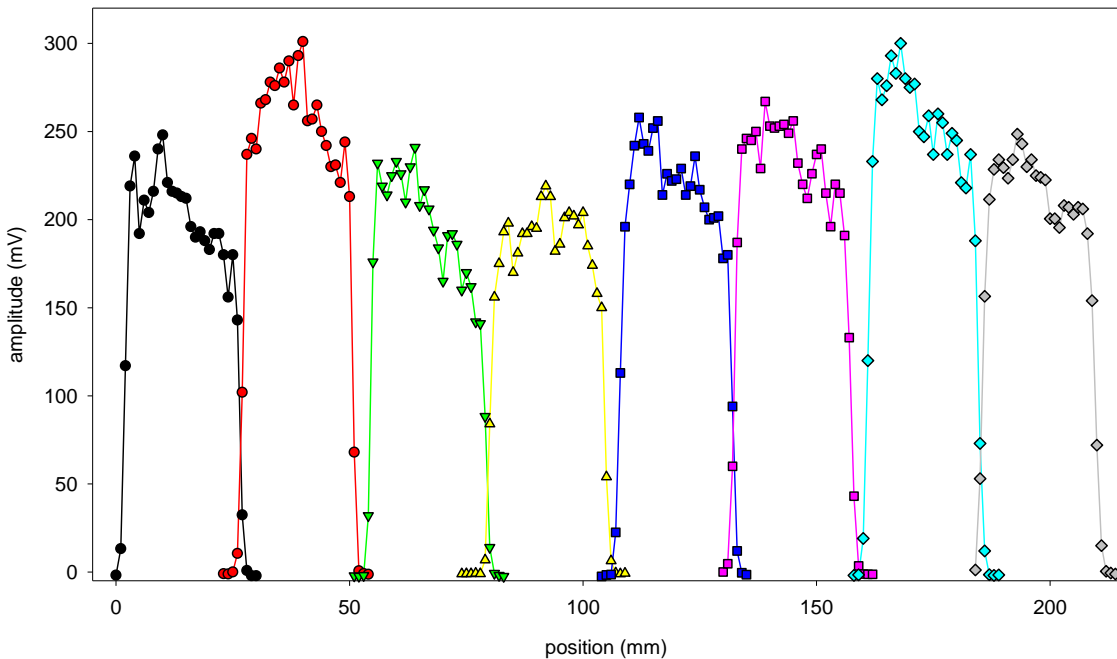
Will measure uniformity response of block...

Prototype 1

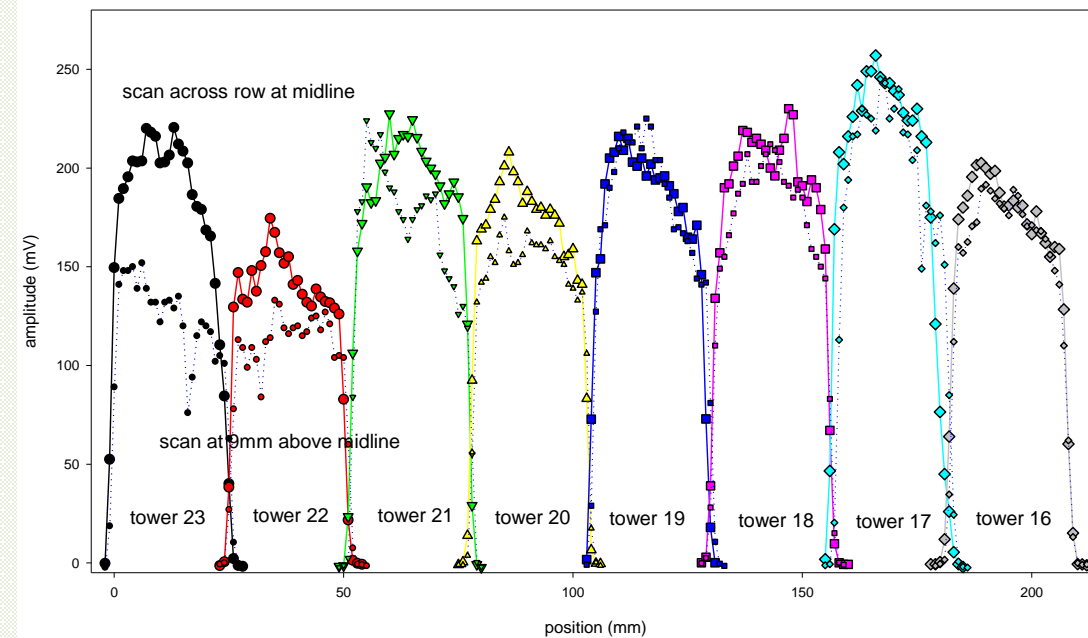
- Measured uniformity across a second row of blocks (towers 24-31)
- Considerations for improving the uniformity – discussed possible solutions with Sal and Bill Lenz
 - repositioning sipms on pcb would be very difficult
 - enlarging hole through pcb would be problematic due to clearance with sipms currently on pcb
 - best solution? - use optical coupling
RTV to hold pcb onto light guides, with
some additional mechanical support
– leave out screws



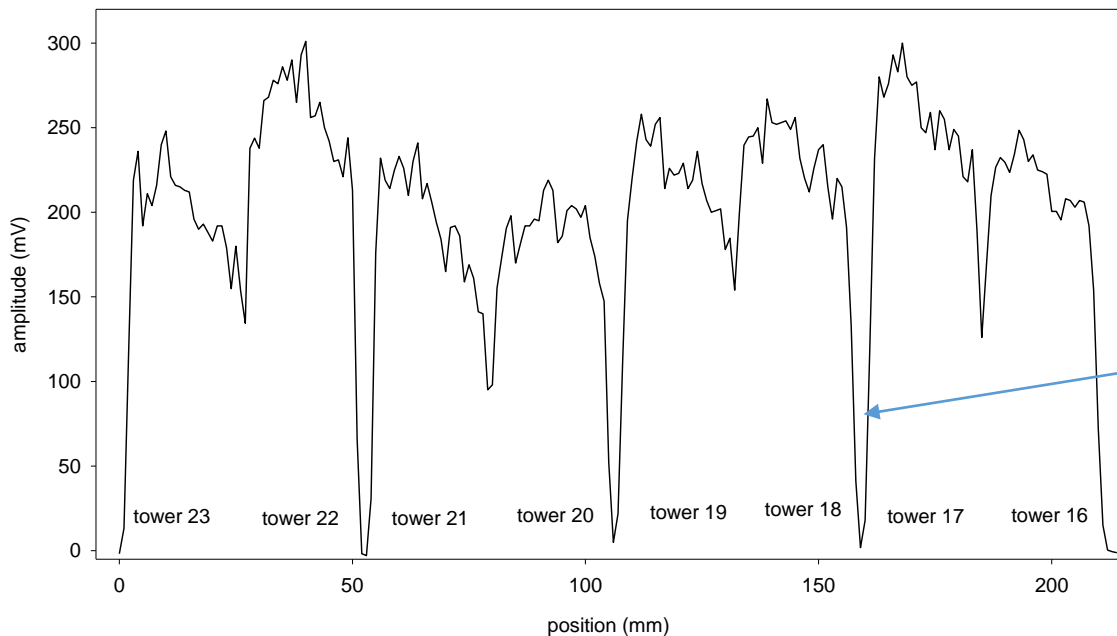
Scan across back of absorber block (reflector removed) with LED/optical fiber (360nm)
 Response measured as tower output (4 sipms > preamp). Sipm gains set to 2.5E5, preamps: HG



Scan across back of absorber block (reflector removed) with LED/optical fiber (360nm)
 Response measured as tower output (4 sipms > preamp). Sipm gains set to 2.5E5, preamps: HG



overall summed response



Clearer
 difference
 between
 tower and
 block
 boundaries

Same “left-
 biased”
 distributions

overall summed response

